

Appl. No. 10/668,172
Amendment dated: August 16, 2005
Reply to OA of: May 16, 2005

Amendments to the Specification:

Please replace third full paragraph on page 2 with the following amended paragraph.

To achieve the object, the composite micro-structured sheet for diffusing and condensing light of the present invention includes a substrate having a top surface and a bottom surface, wherein a plurality of straight trenches with an arc cross-section or a micro-lens array is formed on the bottom surface for diffusing the incident light on the bottom surface, and a plurality of ~~rhombus~~ triangular-type protrusions is formed on the top surface for raising the semi-brightness angle of the light that has passed through the bottom surface.

Please replace the “Brief Description of the Drawings” which begin on page 2 at the bottom of the page and continue onto page 3 with the following amended description.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1a is a perspective view of a preferred embodiment of the composite micro-structured sheet of the present invention;

FIG. 1b is the vertical view of FIG. 1a;

FIG. 2 is a perspective view of the directly-under-light backlight module of the present invention;

FIG. 3 shows the simulation result of Example 2 of the present invention;

FIG. 4 is the upward view of another preferred embodiment of the composite micro-structured sheet of the present invention;

FIG. 5 shows the simulation result of Example 3 of the present invention.

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On page 3, please replace the last full paragraph which bridges page 4 with the following amended paragraph.

The substrate of the composite micro-structured sheet of the present invention could optionally be made of transparent materials or semi-transparent and semi-reflecting materials. Preferably, the substrate is made of polymethyl methacrylate (PMMA) or polycarbonate (PC). The method for forming the straight trenches with an arc cross-section of the present invention is not restricted and the straight trenches with an arc cross-section are preferably constructed of a convex pillar lens array or a concave pillar lens array. The size and focal length of the lenses of the convex pillar lens array or the concave pillar lens array are not restricted. Preferably, the size and focal length of the lenses of the convex pillar lens array or the concave pillar lens array are all the same. The spaces between the lenses of the convex lens array or the concave lens array are optionally equal or different, and are preferably different. The method for forming the micro-lens array is not restricted. Preferably, the micro-lens array is constructed of a convex lens array or a concave lens array. The size and focal length of the lenses of the convex lens array or the concave lens array are not restricted. Preferably, the size and focal length of the lenses of the convex lens array or the concave lens array are all the same. The spaces between the lenses of the convex lens array or the concave lens array are optionally equal or different, and are preferably different. The arrangement of the ~~rhombus~~ triangular-type protrusions of the present invention is not restricted. Preferably, the ~~rhombus~~ triangular-type protrusions are parallel to each other. The included angle between the straight trench with an arc cross-section and the ~~rhombus~~ triangular-type protrusion is preferably ranging from 0 to 90 degrees.

On page 4, please replace Example 1 and subsequent paragraph which bridges page 5 with the following amended paragraph.

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Example 1

With reference to FIG. 1a, there is shown a perspective view of a preferred embodiment of the composite micro-structured sheet of the present invention. The composite micro-structured sheet 1 is composed of the PMMA substrate 10 having a top surface 11 and a bottom surface 12. On the bottom surface 12, there is formed a plurality of straight trenches 13 that are parallel to each other and constructed of concave pillar lenses, and have an arc cross-section for diffusing the incident light on the bottom surface 12. On the top surface 11, there is formed a plurality of rhombus triangular-type protrusions 14 for raising the semi-brightness angle of the light that has passed through the bottom surface 12. The rhombus triangular-type protrusions 14 intersect the straight trenches 13 and the included angle therebetween is 30 degrees, as shown in FIG. 1b.

Please replace Example 2 on page 5 and the subsequent paragraph which bridges page 6 with the following amended paragraph.

Example 2

With reference to FIG. 2, there is shown a perspective view of another preferred embodiment of the directly-under-light backlight module of the present invention. The backlight module 100 includes a light source 110, a reflective housing 120, and a composite micro-structured sheet 130. The light source 110 is a cold cathode fluorescent lamp for providing the illuminating light. The reflective housing 120 is adjacent to the light source 110 for receiving the light source 110 and reflecting the illuminating light from the light source 110. The reflective housing 120 is optionally made by stamping or by extrusion. Preferably, the inner surface of the reflective housing 120 is coated with a reflecting and diffusing material for enhancing the reflecting efficiency. The composite micro-structured sheet 130 is the same with the composite micro-structured sheet 1 of Example 1. The composite micro-structured sheet 130 having a top surface 131 and a bottom surface 132 is above the light source 110,

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wherein the bottom surface 132 is closer to the light source 110 than the top surface 131. A plurality of straight trenches 133 with an arc cross-section is formed on the bottom surface 132 for diffusing the illuminating light from the light source 110. A plurality of ~~rhombus~~ triangular-type protrusions 134 is formed on the top surface 131. The illuminating light is first diffused by the straight trenches 133 on the bottom surface 132, then passes through the composite micro-structured sheet 130, and finally arrives at the ~~rhombus~~ triangular-type protrusions 134 on the top surface 131 that raises the semi-brightness angle of the illuminating light, which results in condensing of light and enhancement of brightness.